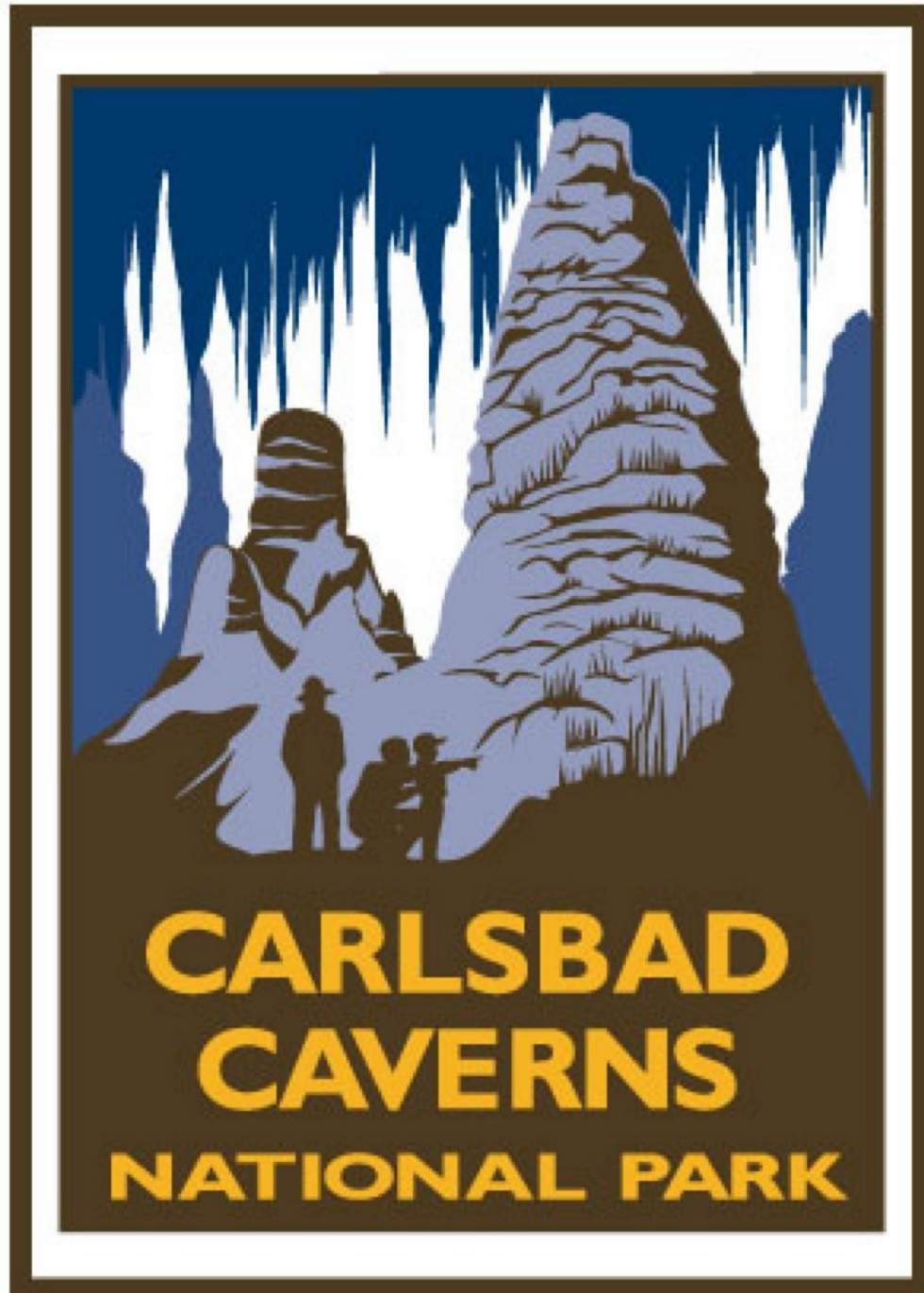


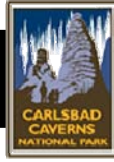
About Bats, Caves, & Deserts

A curriculum and activity guide for Carlsbad Caverns National Park



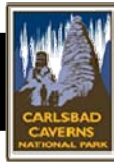
Elementary School





Section 12 – ParKids Productions and Video Activities

- **ParKids Productions**
- **A Short Story About a Deep Subject**
- **Stewardship**
- **It's All About Caving Safety and Caving Rules**
- **Bats! Bats! Bats!**



ParKids Productions

Project Background and Purpose

The title of the “series” is ParKids Productions. This scope of work pertains only to one video, *ParKids Productions Presents Carlsbad Caverns National Park*. Using *Parks As Classrooms* funding, Carlsbad Caverns National Park produced the first in what is hoped to become a series of educational videos that feature the resources of America’s national parks. Schools that routinely visit the park may request a free copy of the video for their library. Teachers are encouraged to use the video to prepare their students for field trips to the Caverns.

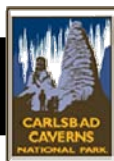
Carlsbad’s video has four major parts. Part 1 covers the history of the caverns, and is itself divided into four segments—geological history, American Indian influence, guano mining period, and National Park Service management. Part 2 is about park stewardship. Part 3 explains cave safety rules. Part 4 concludes the video with a bat skit and rap—dispelling many bat myths and presenting bats as beneficial to our environment.

The purposes of *ParKids Productions Presents Carlsbad Caverns National Park* are as follows:

- To prepare and excite elementary students about their upcoming field trips to Carlsbad Caverns National Park through a curriculum-based video.
- To introduce or reinforce the significance of Carlsbad Caverns to families visiting the park.
- To create a curiosity among young children so that they will wish to learn more about park resources.
- To allow students who are unable to visit the park to have a long-distance “park experience.”

ParKids Productions Presents Carlsbad Caverns National Park’s four video segments collectively will aid the students in obtaining the following:

- An insight into the mission of the National Park Service.
- An understanding of and appreciation for the reasons behind park rules.
- The realization that cave exploration is exciting and educational, but is dangerous if rules are not followed.
- A desire to help take care of Carlsbad Caverns because it has a monumental past and holds the key to many stories yet untold.



A Short Story About a Deep Subject

Part 1: The History and Geology of Carlsbad Caverns National Park

Pre-Visit, Field Trip and Post-Visit Activities

Primary/Elementary and Intermediate Levels

Science (Unifying Concepts, Inquiry, Life, Personal) **Language Arts** (Unifying Concepts, Listen and Read, Speak and Write), **Social Studies** (Environment), **Math** (Geometry and Measurement Concepts)

**60 minutes Pre-Visit, Field Trip, Two 60 minute sessions
plus more if needed for perfection of brochure and evaluation**

Objective(s)

- Students will identify Carlsbad Caverns National Park as part of the Permian sea by listing its characteristics.
- Students will explain the history as recorded through rocks and various artifacts.
- Students will define a fossil by describing how one is formed.
- Students will identify and depict the three mountain ranges as part of the Capitan Reef.
- Students will describe the process of Carlsbad Caverns' cave formations.
- Students will identify the impact of the internal and external climate of Carlsbad Caverns on the dress preparation.

Related NM Content Standards with Benchmarks. SC1-E1, SC1-E1, SC2-E3, SC2-M3, SC4-E1, SC4-E2, SC4-E3, SC5-E2, SC5-M2, SC6-M6, SC9-ME, SC12-E3, SC12-E5, SC12-E3, SC12-E6, LA1-E1, LA1-E2, LA1-M2, LA1-H2, LA2-E4, LA2-M4, LA2-H4, LA3-E3, LA3-M3, LA3-H3, LA4-E1, LA4-M1, LA4-E7, LA5-E1, LA5-M1, LA5-H1, LA6-E1, LA6-E3, LA6-M3, SS12-E6, MA9-E1

Method

- View the video Part 1 on the geology and history of Carlsbad National Parks.
- Read Geology of Carlsbad Caverns and About Types of Caves.

Materials. Video "ParKids Productions," New Mexico map, The Geology of Carlsbad Caverns, Jim White, Carlsbad Caverns National Park Area History, 1848-1998, fact cards at bottom of page, drawing paper, pencil, color pencils, pocket journals

Key Vocabulary. reef, fossil, desert, marine organisms, calcite, limestone, sulfuric acid, carbonic acid

Background. Carlsbad Caverns, located in the Chihuahuan Desert, is an ancient marine fossil reef called Capitan Reef. It has a radius of 400 miles and includes 3 mountain ranges—the

Apache, Glass and Guadalupe. Many scientists believe that 250 million years ago this reef was covered by the Permian Sea. The history is recorded in the stone fossil as observed in the fossilized marine organisms.

The combinations of dirt, sand and calcite hardened the remains of marine organisms. Compacted and under pressure these organisms became cemented into limestone. Carlsbad Caverns was formed when water mixed with sulfuric acid seeped through the cracks in the rocks. The seeping water dissolved the rocks—making the cracks larger and larger. The cracks became water-filled underground rooms. Eventually the reef rose above ground and air replaced groundwater. Without the water to support the ceiling, large pieces of the ceiling collapsed. Large rooms and hallways resulted from the process.

Pictographs are prehistoric records of human existence. These are usually found in areas protected from sun and weather. Human preservation efforts ensure these to be enjoyed and studied in the future.

Although he was not the first man to discover the cave, Jim White made Carlsbad Caverns famous through his exploration efforts. During the twenty years bat guano was mined in the cave, White worked for all but one of the mining companies. In his spare time he continued exploring the cave. Guano mining stopped in 1923 when Carlsbad Caverns became part of the National Park System. As the park's first ranger, White made the cave more accessible to the public.

Suggested Pre-visit Procedure for Carlsbad Caverns National Park Brochure

1. Provide students with vocabulary before viewing video.
2. Introduce the brochure and its use as an accurate source of information for tourist. (see the brochure rubric)
3. View Part 1 of the video, *ParKids Productions*, for the brochure information. Have students take notes in notebooks.
4. Stop the video after the geology section and discuss cave formation and fossils.
5. Locate Carlsbad Caverns and the three mountain ranges on a New Mexico map.
6. Continue viewing part one of the video on history. Provide students with information from fact sheets. Provide time for students to create a timeline to be included in their brochure.
7. Review the brochure criteria and expectations for quality using the rubric. Provide a rubric for each student.
8. Break into groups and have students glean information from fact sheets.
9. While still in the groups provide the students with fact cards found at bottom of page. Students will read the information to determine the cave type of Carlsbad Caverns.
10. Have students independently create a rough draft of their brochure.

Suggested Field Trip Procedure for Carlsbad Caverns National Park Brochure. The students will pick up various brochures related to Carlsbad Caverns and surrounding areas. Students will observe the various cave formations within the cave. They will also observe the landscape surrounding the visitor center. Be sure students take note of the external and internal

climate. Ask them what they can observe in visitors that demonstrates the impact of the two climates.

Suggested Post-Visit Procedure for Carlsbad Caverns National Park Brochure

1. Compare and contrast the student-made brochure with the brochures gathered from the field trip. Students will make recommendations and provide positive feedback for their brochures and the brochures of classmates.
2. Revise rough draft based on feedback. Students will create the final draft of their brochure.
3. Students evaluate their brochure and exchange for a peer evaluation.
4. Students will present their brochure to the group. Students will make recommendations and provide positive feedback for their brochures and the brochures of classmates.

Suggested Expansion. *Use as a multimedia activity.*

- Assign students to create a multimedia brochure using PowerPoint or HyperStudio
- OR
- Create a computer generated 3-fold brochure. Brochure could be created in small groups.

Types of Caves – Fact Cards	
Solution Caves Formed by weak, natural acid dissolving soluble rocks such as limestone, dolomite, gypsum and marble.	Lava Tubes Formed during the cooling of lava flows. First, a crust forms on the lava as it begins to cool. A break in this crust allows some of the molten lava to flow through the break leaving long, tunnel-like passages.
Sea Caves Formed from wave action. The waves force water into the cracks in rock, breaking off the rock.	Wind Caves Formed from wind erosion or cliffs or hills. They are almost always small caves that seldom penetrate into total darkness.
Talus Caves Formed from huge rocks that have fallen from cliffs.	Glacier Caves Formed by melting waters moving through glaciers.
Soil Caves Formed when flash floods move through the soils and transport earth with them. They are found in desert areas.	Tectonic Caves Formed by the action of earthquakes.

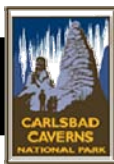
Brochure Advertising Carlsbad Caverns National Park

Name: _____

Grades: (4) Very Few Errors, (3) Few Errors, (2) Several Errors, (1) Incomplete, (0) Not Evident

Visual_____ Content and Written_____ Presentation_____ Overall_____

	Self	Peer	Teacher	Comments
Brochure – Quality of Visual			/44	
Brochure is neat and free of wrinkles and extra marks			/4	
Lettering is neat, evenly spaced, and legible			/4	
Illustrations: _____colorful _____ neat _____ focused _____ fills area _____ detailed			/20	
The brochure is an accurate source of information for the tourist.			/4	
Descriptions are clear, concise, and use a variety of vocabulary			/4	
Correct spelling and usage of vocabulary			/4	
Complete sentences with capitals, punctuation, and complete thought.			/4	
Content and Written			/28	
Brochure is interesting and follows a central theme.			/4	
Brochure includes: __Location __Timeline __Mountain Ranges __Cave Type and Formation __Formation of Fossils __Internal and External Climate and its Impact on Dress			/24	
Presentation of Brochure			/20	
Sequenced and uses the brochure as part of the presentation			/4	
Variety of voice			/4	
Eye contact with audience			/4	
Interesting and informative			/4	
Prepared with appropriate materials and evidence of rehearsal			/4	



Stewardship

Part 2: Stewardship of Carlsbad Caverns National Park

Pre-Visit, Field Trip and Post-Visit Activity

Primary/Elementary and Intermediate Levels

Science (Inquiry, Life, Technology), **Language Arts** (Unifying Concepts, Listen and Read, Speak and Write), **Art** (Theater and Visual)

60 minutes Pre-Visit, Field Trip, Two 60 minute sessions plus more if needed for perfection of script, performance and evaluation.

Objective(s)

- Students will define stewardship and identify daily applications.
- Students will illustrate the basic rules of stewardship as it applies to Carlsbad Caverns National Park.

Related NM Content Standards with Benchmarks. SC5-E2, SC5-M2, SC6-M6, SC11-E8, SC11-E6, SC15-E2, AE1-E1, AE1-M1, AE1-E2, AE2-E3, AE4-E7, AE8-E9, LA1-E1, LA1-E2, LA1-M2, LA1-H2, LA2-E4, LA2-M4, LA2-H4, LA3-E3, LA3-M3, LA3-H3, LA4-E1, LA4-M1, LA4-E7, LA5-E1, LA5-M1, LA5-H1, LA5-E5, LA6-E1, LA6-E3, LA6-M3

Method. Students review rules through discussion and viewing Part 2 of ParKids Production/Stewardship.

Materials. Video “ParKids Productions,” drawing paper, pencil, color pencils, pocket journals

Key Vocabulary. stewardship

Background. Stewardship on the National Park System involves a staggering 83 million acres. Many experienced volunteers donate thousands of hours to restore and conserve the caves. Stewards view caves as a precious nonrenewable resource.

Suggested Pre-visit Procedure for Carlsbad Caverns National Park

1. To introduce the lesson on stewardship, the teacher will conduct a brief discussion on rules which students view to be related to safety and preservation of Carlsbad Caverns National Park. Explain to students that they will be creating a four-fold books depicting stewardship and the basic rules of stewardship.
2. Ask the students what rules they think will be included in the video. First, have students record their ideas in their pocket journal. Then discuss in pairs. Have students form groups of four by combining two pairs and discuss their answers. Students should make revisions and additions here.
3. View Part 2 of *ParKids Productions*. The teacher will stop and start the video to reinforce definition and rules.
4. Discuss correlation between student and video suggestions. Ask students why the rules of stewardship apply and how each of them could contribute to the park.

Suggested Field Trip Procedure for Carlsbad Caverns National Park

1. Review the rules of stewardship. Have students silently observe another person and note how they were stewards of the park.
2. As the fieldtrip progresses have the park ranger identify ways students could contribute in a positive way to the needs of the park presently and in the future.

Suggested Post-Visit Procedure for Carlsbad Caverns National Park

1. Have students share how each of them observed the rules of stewardship, what they observed in another person and a suggestion for their wish for the future of the park.
2. Explain the procedure for making the four-fold book using the directions provided.
3. Have students design a cover depicting the definition of stewardship and the concepts presented in video and the field trip. They are to use a page to identify one basic rule with possible elaboration. The page facing the written is to illustrate the rule. Students should fill the book with the rules of stewardship. Refer to rubric as a guide for students and grading.

Suggested Expansion

- Assign students to create a multimedia presentation on stewardship using PowerPoint or HyperStudio
- OR
- The book could be created in small groups. ABCD has suggested other stewardship activities. These may be incorporated to fill the needs of your students.

Four-Fold Book

Materials: Any size paper. Large sheets of newsprint work well. Scissors are optional.

Steps:

1. Fold paper in half lengthwise. Fold in half again. Fold in half again.
2. Open and re-fold width-wise. Cut from center of fold edge to center of paper.
3. Open the slit.
4. Pull points D and B out while pushing A and C to the middle forming a plus sign.
5. Bring points D and B toward you. Bring remaining point toward to make the book.
6. Crease the main folds well.
7. To increase the number of pages, glue two or more books together.

*The slit for this book may be torn rather than cut if scissors are not available. The initial folds must be creased very well.

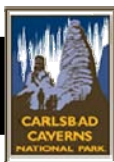
Four-Fold Book on Stewardship

Name: _____

Grades: (4) Very Few Errors, (3) Few Errors, (2) Several Errors, (1) Incomplete, (0) Not Evident

Visual _____ Content and Written _____ Presentation _____ Overall _____

	Self	Peer	Teacher	Comments
Four-Fold Book Quality Visual			/44	
Book is neat and free of wrinkles and extra marks.			/4	
Lettering is neat, evenly spaced, and legible			/4	
Illustrations: __ colorful __ neat __ focused __ fills area __ detailed			/20	
The book is an accurate source of information on stewardship.			/4	
Descriptions are clear, concise, and use a variety of vocabulary.			/4	
Correct spelling and usage of vocabulary.			/4	
Complete sentences with capitals, punctuation, and complete thought.			/4	
Book - Content and Written			/20	
Book is interesting and follows a central theme of stewardship.			/4	
Book includes: __Definition of stewardship __Rules of Stewardship __Illustrations of Each Rule __Elaboration included for each rule and/or additional rules may be referred to and explained.			/16	
Presentation of Book			/20	
Sequenced			/4	
Variety of voice			/4	
Eye contact with audience			/4	
Interesting and informative			/4	
Prepared with appropriate materials and evidence of rehearsal.			/4	



It's All About Caving Safety and Caving Rules

Part 3: Caving Safety

Pre-Visit, Field Trip and Post-Visit Activity

Primary/Elementary and Intermediate Levels

Science (Inquiry, Life), **Language Arts** (Unifying Concepts, Listen and Read, Write and Speak), **Social Studies** (Environment)

60 minutes Pre-Visit, Field Trip, Two 60 minute sessions plus more if needed for perfection of book and evaluation.

Objective(s)

- Students will identify rules of safe caving.
- Students will effectively communicate the message of cave preservation.
- Students will elaborate on the three rules of safe caving.

Related NM Content Standards with Benchmarks. SC-5E3, SC-5M2, SC11-E1, SC11-E9, SS11-E3, LA1-E1, LA1-E2, LA1-M2, LA1-H2, LA2-E4, LA2-M4, LA2-H4, LA3-E3, LA3-M3, LA3-H3, LA4-E1, LA4-M1, LA4-E7, LA5-E1, LA5-M1, LA5-H1, LA6-E1, LA6, E3, LA6-M3

Method

- View the video, Part 3 of the *ParKids Production* Video.
- Read "Safe Cave Exploration" in Section 2 – just the Facts.

Materials. Video "*ParKids Productions*," Safe Cave Exploration, fact cards, pencil, pocket journals. Art supplies will vary according to what the students use in their skits.

Background. Cave safety involves responsible planning.

Suggested Pre-visit Procedure for Carlsbad Caverns National Park Skit

1. Introduce the skit. (See the brochure rubric.)
2. View Part 3 of the video, *ParKids Productions*, for skit information. Have students take notes in notebooks.
3. Stop the video after the caving section and discuss cavers' rules of three.
4. Break students into groups of five and have them plan, write and create props for their skit depicting cave safety and preservation of the cave environment. (See rubric for the skit.)
5. Have students exchange their skit with another group for feedback. Tell students to list the materials needed.

Suggested Field Trip Procedure for Carlsbad Caverns National Park. The students will take notes on park ranger presentation on cave safety and cave preservation. They will also want to note observation of self and others as it relates to cave safety and cave preservation. Have

students look for cave formations that have obviously been touched and compare them to formations that have not. Have students look for cave hazards and elaborate on the rules of three. Students should note evidence of human impact on the natural cave environment.

Suggested Post-Visit Procedure for Carlsbad Caverns National Park

1. Compare and contrast the information gained through the video with the information provided by the park ranger and student observations.
2. Revise rough draft of the skit script based on feedback from peer students and observations. Students will create the final draft of their script.
3. Provide time for students to practice skits.
4. Have students perform their skit and have students provide peer evaluation based on the rubric requirement.

Suggested Expansion

- Use as a multimedia activity. Assign students to create a multimedia presentation using PowerPoint or HyperStudio.

OR

- Create a computer-generated slideshow.

Skits may be performed for other classes.

Skit and Props on Caving Safety

Name: _____

Grades: (4) Very Few Errors (3) Few Errors (2) Several Errors (1) Incomplete (0) Not Evident

Visual _____ Content and Written _____ Presentation _____ Overall _____

	Self	Peer	Teacher	Comments
Skit Props - Quality of Visual			/36	
Props are neat and free of wrinkles and extra marks.			/4	
Lettering is neat, evenly spaced, and legible.			/4	
Illustrations: ___ colorful ___ neat ___ focused ___ fills area ___ detailed			/20	
The prop(s) accurately relate to, and communicate the message of the skit.			/4	
Props are appropriate to the skit.			/4	
Script – Content and Written			/36	
Descriptions are clear, concise, and use a variety of vocabulary.			/4	
Complete sentences with capitals, punctuation, and complete thought.			/4	
The script and props are interesting and follows the central theme of caving safety.			/4	
The script includes correct spelling and usage of vocabulary.			/4	
Script: ___ Communicates Rules of Three ___ Costume is appropriate to script ___ Props are appropriate to the message ___ Defines Cave Safety ___ Elaboration is included for each rule and/or additional rules may be referred to and explained			/20	
Presentation of Skit			/20	
Sequenced with use of props			/4	
Variety of voice			/4	
Eye contact with audience			/4	
Interesting and informative			/4	
Prepared with appropriate materials and evidence of rehearsal			/4	



Bats, Bats, Bats!!!

Part 4: Respecting and Understanding Bats

Pre-Visit, Field Trip and Post-Visit Activities

Primary/Elementary and Intermediate Levels

Science (Unifying Concepts, Inquiry, Life, Technology, Personal), **Language Arts** (Unifying Concepts, Listen and Read, Write and Speak), **Social Studies** (Technology)

**60 minutes Pre-Visit, Field Trip, Two 60 minute sessions
plus more if needed for perfection of game, gameboard, and evaluation**

Objective(s)

- Students will identify common myths about bats.
- Students will effectively communicate the message of bat preservation.
- Students will elaborate on bats and their benefit to the environment and to humans.
- Students will identify the role of bats in their ecosystem.
- Students will identify the common bats found at Carlsbad Caverns National Park.
- Students will classify and identify the characteristics unique to each classification relating to bats.

Related NM Content Standards with Benchmarks. SC2-E3, SC5-E2, SC5-M2, SC6-M6, SC10-E1, SC11-E6, SC15-E2, SC16-E2, SS14-E3, LA1-E1, LA1-E2, LA1-M2, LA1-H2, LA2-E4, LA2-M4, LA2-H4, LA3-E3, LA3-M3, LA3-H3, LA3-E4, LA4-E1, LA4-M1, LA4-E7, LA5-E1, LA5-M1, LA5-H1, LA6-E1, LA6-E3, LA6-M3

Method. View the video Part 4 Bats of Carlsbad National Park.

Read "The Bats of Carlsbad Caverns and Elsewhere" in Section 2 – Just the Facts.

Students will create a game of knowledge and chance

Materials. Video "ParKids Productions," The Bats of Carlsbad Caverns and Elsewhere in Section 2 – Just the Facts, game card template, pencil, markers, paper, glue, spinner or dice, pocket journals

Vocabulary. scat

Background. At Carlsbad Caverns there is a large, active colony of roosting bats with a long-term occupancy record dating back 5,000 years. The population of bats has been steadily decreasing over the years. This decrease can be linked to a lack of knowledge and awareness of the beneficial contributions of their existence.

Suggested Pre-visit Procedure for Carlsbad Caverns National Park Skit

1. Introduce the game concept. (see the game board and game cards rubric) Explain to students that they will need a variety of resources. Students will need to gather bat facts

from books, the video, presentations, Just the Facts and interviews to provide a large range of questions relating to the objectives. Review the objective with the students so they will know what types of questions to create.

2. View Part 4 of the video, *"ParKids Productions,"* for game information. Have students take notes in notebooks.
3. Stop the video after the bat section and discuss myths and facts relating to bats. Ask students how they felt for the bats in question.
4. Break students into groups of two and have them plan, write, and create game boards, cards, playing strategy, and the rules of the game. See rubric. The design of the game must be related to the bat theme, must provide a variety of accurate information and include chance.
5. Have students share their rules, game ideas and bat facts with another group. They should review the rubric to provide feedback for each other. Students should provide a list of materials needed.

Suggested Field Trip Procedure for Carlsbad Caverns National Park Game

1. The students will take notes on the park ranger presentation on as it relates to bats. They will also want to note any observation and evidence of bat life within Carlsbad Caverns National Park.
2. While at the park students will interview park visitors about their bat knowledge. Record information to share during the post visit activities. Extend the interviews at home with parents and neighbors.

Suggested Post-Visit Procedure for Carlsbad Caverns National Park Game

1. Compare and contrast the information gained through the video with the information provided by the park ranger, student observations and student interviews. Create a t-chart (myth and or inaccurate information vs. factual) and share their information with the class. The teacher may want to display these charts.
2. Revise rough draft of the game cards and board based on feedback from peers and observations. Students will create the final version of their game.
3. Provide time for students to polish the games.
4. Have students share their game. Provide time for students to play games created by others. Have students provide peer evaluation based on the rubric requirement.

Suggested Expansion

- Games may be shared as part of an open house or conference where students may share their games with their parents and allow others to play their game.
- You may have a game day where students rotate around the room playing the games of others.
- You may want to display the games in centers where students can play as they have time.
- Games could be shared with other classes by inviting another class to partner with your class to play.

- Students could create a digital game based on a multimedia program such as HyperStudio.

Bat Game Card

To be copied for student's use.

Bat Game and Game Board

Name: _____

Grades: (4) Very Few Errors (3) Few Errors (2) Several Errors (1) Incomplete (0) Not Evident

Visual_____ Content and Written_____ Presentation_____ Overall_____

	Self	Peer	Teacher	Comments
Game and Board - Quality			/44	
The board and cards are neat and free of wrinkles and extra marks.			/4	
Lettering is neat, evenly spaced, and legible.			/4	
Illustrations: __colorful __neat __ focused __ fills area __ detailed			/20	
The game is accurate in its information to provide a game of knowledge.			/4	
Directions are clear, concise, and use a variety of vocabulary.			/4	
Correct spelling and usage of vocabulary.			/4	
Complete sentence with capitals, punctuation, and complete thought.			/4	
Game and Board - Content and Written			/24	
The game is interesting and follows a central theme.			/4	
Game includes: __ Board __ Cards __ Directions __ Spinner or Dice __ Markers			/20	
Presentation of the Game			/20	
Sequenced			/4	
Variety of voice			/4	
Eye contact with audience			/4	
Interesting and informative in describing the skill of knowledge and chance as it relates to bats.			/4	
Prepared with appropriate materials and evidence of rehearsal.			/4	